



**Anirudha V. Sumant**

*Assistant Materials Scientist*

Theme: Nanofabrication

Phone: 630-252-4854

Fax: 630-252-5739

e-mail: sumant@anl.gov

Argonne National Laboratory  
Center for Nanoscale Materials  
9700 S. Cass Ave.  
Argonne, IL 60439

**Research Summary:**

My research expertise is primarily in the area of synthesis and processing of CVD-diamond thin films and other carbon based materials such as diamond-like carbon and carbon nanotubes/nanofibers. My research interests include nucleation and growth of diamond thin films, surface chemistry of diamond surfaces, micro and nano-scale tribology, MEMS/NEMS fabrication, and field emission. At CNM, my research work is currently focused on the integration of ultrananocrystalline diamond/PZT for the fabrication of piezoactuated resonators and nano-scale switches to develop CMOS compatible diamond based NEMS.

**Selected Representative Publications:**

1. A. V. Sumant, D. S. Grierson, A. R. Konicek, M. Abrecht, P.U.P.A. Gilbert, J. E. Butler, T. Feygelson, S. Rotter, R. W. Carpick, "Surface composition, bonding and morphology in the nucleation and growth ultra-thin, high quality nanocrystalline diamond thin films," *Diam. Relat. Mater.* Vol. 16, 718 (2007).
2. J.A. Bares, A.V. Sumant, D.S. Grierson, R.W. Carpick, and K. Sridharan, "Small amplitude reciprocating wear performance of diamond-like carbon films: Dependence of film composition and counterface material," *Trib. Lett.* Vol. 27(1), 79 (2007).
3. H. Y. Yap, B. Ramaker, A. V. Sumant and R. W. Carpick, "Growth of mechanically fixed and isolated vertically-aligned carbon nanotubes and nanofibers for nanomechanical testing by DC-Plasma enhanced hot filament chemical vapor deposition system," *Diam. Relat. Mater.* Vol. 15, 1622 (2006). [*Selected in the list of TOP 25, most downloaded paper*]
4. A.V. Sumant, D. S. Grierson, J. E. Gerbi, J. Birrell, U. D. Lanke, O. Auciello, J. A. Carlisle, and R. W. Carpick, "Towards the ultimate tribological interface: Surface chemistry and nanotribology of ultrananocrystalline diamond," *Adv. Mater.* Vol. 17, 1039 (2005). [*A news article entitled "No more rough diamonds" appeared on the Nature news and Materials Connections (MRS) web sites based on this paper*]
5. A. V. Sumant, O. Auciello, A. R. Krauss, D. M. Gruen, D. Ersoy, J. Tucek, N. Moldovan and D. Mancini, "Fabrication of MEMS components based on ultrananocrystalline diamond thin films and characterization of mechanical properties," *Mat. Res. Symp. Proc.* 657, (2000).